



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,894	11/13/2001	Akira Yonemizu	215872US2	6142
22850	7590	11-25/2003	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			MOORE, KARLA A	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 11/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/986,894

Applicant(s)

YONEMIZU ET AL.

Examiner

Karla Moore

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-11,13,14 and 22-37 is/are pending in the application.
- 4a) Of the above claim(s) 22-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-11,13 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 8-9, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,235,634 to White et al. in view of U.S. Patent No. 6,403,924 to Hayashi.

4. White et al. disclose an apparatus substantially as claimed in Figure 7 disposed adjacent a main transfer mechanism (520,522) for processing a substrate, comprising: a heating process chamber (534) in which a heating process is performed for the substrate one by one; a load lock chamber (530), integrally connected to the heating process chamber in a predetermined direction, having an opening closable with a shutter (column 5, rows 42-43) allowing the substrate to be transferred between the main transfer mechanism and the load lock chamber, and transferring the substrate between the main transfer mechanism and the heating process chamber through the opening, controlling at least oxygen concentration and pressure (the chamber can be maintained at a vacuum level, which inherently controls both the oxygen concentration and the pressure); a transferring arm (column 8, rows 31-35) capable of moving between the heating process chamber and the load lock chamber and transferring the substrate one by one between the heating process chamber and the load lock chamber, and transferring the

substrate between the main transfer mechanism and the heating chamber through the opening; and a gate valve (column 8, rows 31-35) shielding the heating process chamber from the load lock chamber. Examiner realizes that all features of the claimed invention recited above are not explicitly referenced in White et al., however, each of the elements is fairly suggested in alternative embodiments, which one of ordinary skill in the art are combinable to take advantage of key features of the invention.

8. White et al. disclose the invention substantially as claimed and as described above.

9. However, White et al. fail to teach the transferring arm having a temperature adjusting portion for adjusting a temperature of the substrate placed thereon.

10. Hayashi teaches the use of a transfer arm with a temperature adjusting portion capable of cooling a substrate for the purpose of quickly cooling down a substrate (column 8, rows 40-50 and column 12, rows 1-2).

11. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transfer arm with a temperature adjusting portion in White et al. in order to quickly cool down a substrate as taught by Hayashi.

12. With respect to claim 8, the load lock chamber of the apparatus further comprises: an opening through which the substrate is transferred to/from the outside, and a shutter allowing the opening to be opened and closed (column 5, rows 42-43).

13. With respect to claim 9, the transferring arm further comprises a waiting portion (column 8, rows 25-28) in the load lock chamber for temporarily placing the substrate prior to entry into the heating chamber. In the cited passage, the "heating chamber" refers to a "loadlock heating chamber" which is comparable to the "heating chamber" in the Figure 7 embodiment of the invention described above.

14. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. and Hayashi as applied to claims 1, 8-9, 11 and 13 above, and further in view of U.S. Patent No. 5,286,296 to Sato et al and U.S. Patent No. 6,083,566 to Whitesell.

15. White et al. and Hayashi disclose the invention substantially as claimed and as described above.

16. However, White et al. and Hayashi fail to disclose a first exhausting portion for vacuum exhaustion, a second exhausting portion for normal exhaustion and a selecting portion adaptively selecting the first exhausting portion or the second exhausting portion and causing the selected portion to operate.

17. Sato et al. disclose a load lock chamber comprising a first exhausting portion (12, turbo molecular pump) and a second vacuum exhaustion portion (13, booster pump) (column 4, rows 54-62; column 6, row 58 thru column 7, row 2; column 11, rows 10-15). The first and second exhausting portions connected to a chamber are provided for the purpose of reducing the chamber pressure to different vacuum levels; therefore, the chamber pressure can be set a desired value (abstract). The first and second exhausting portions are capable of reducing the inner pressure of a chamber to 1330 Pa or less (column 4, rows 57-59) and 100,000 Pa or less (column 5, rows 11-16), respectively.

18. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided first and second evacuation portions in White et al. and Hayashi in order to reduce the chamber to different vacuum levels, thus obtaining the desired chamber pressure as taught by Sato et al.

19. White et al., Hayashi and Sato et al. disclose the invention substantially as claimed and as described above.

20. However, none of White et al., Hayashi and Sato et al. teach the use of a selecting portion for adaptively selecting a first exhausting portion or a second exhausting portion.

21. Whitesell teaches the use of first and second exhausting portions along with a controller for the purpose of controlling the two exhaust portions (column 4, rows 54-62; column 6, row 58 through column 7, row 2; and column 10, rows 50-55).

22. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller for the exhausting portions in White et al., Hayashi and Sato et al. in order to control the exhausting portions as needed as taught by Whitesell.

Art Unit: 1763

23. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. and Hayashi as applied to claims 1, 8-9, 11 and 13 above, and further in view of U.S. Patent No. 4,389,970 to Edgerton.

24. White et al. and Hayashi disclose the invention substantially as claimed and as described above.

25. However, White et al. and Hayashi fail to disclose a controller for controlling the temperature of the heating process for the substrate in the heating process chamber. The controller capable of controlling the temperature in the range from 100 degrees C to 800 degrees C.

26. Edgerton teach the use of heating means and a detector for the purpose of controlling circuitry for continuously adjusting the intensity of the heating means to regulate substrate temperature (abstract). The controller is capable of controlling the temperature in the range of 100 degrees C and 800 degrees C (column 7, rows 7-11).

27. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a controller in White et al. and Hayashi in order to regulate substrate temperature as taught by Edgerton.

28. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. and Hayashi as applied to claims 1, 8-9, 11 and 13 above, and further in view of U.S. Patent No. 6,079,928 to Theriault et al.

29. White et al. and Hayashi disclose the invention substantially as claimed and as described above.

30. However, White et al. and Hayashi fail to disclose a supplier supplying an inert gas to the heating process chamber.

31. Theriault et al. teach supplying an inert gas to a heating chamber for the purpose of filling a chamber with an inert gas to obtain active heating so as to supplement radiant heat within the chamber (column 6, rows 65 through column 7, row 1).

32. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an inert gas supply in the heating chamber in White et al. and Hayashi in

order to fill a chamber with an inert gas to obtain active heating so as to supplement radiant heat within the chamber as taught by Theriault et al.

33. Claims 10 and 14 are rejected under 35U.S.C. 103(a) as being unpatentable over White et al. and Hayashi as applied to claims 1, 8-9, 11 and 13 above, and further in view of U.S. Patent No. 5,735,961 to Shimada.

34. White et al. and Hayashi disclose the invention substantially as claimed and as described above.

35. However, White et al. and Hayashi fail to teach a supplier supplying an active gas to the load lock chamber and a sprayer spraying the active gas to a front surface of the substrate in the load lock chamber so as to reform the front surface of the substrate.

36. Shimada teaches the use of an oxygen (active gas) supply pipe (Figure 1, 19; supplier) in communication with a gas supply pipe (11; sprayer) supplying oxygen to the load lock chamber connected to a heat process chamber for the purpose of generating a native oxide layer on wafers while loaded in the load lock chamber (column 4, rows 50-64 and column 5, rows 50-54).

37. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a supplier and sprayer in the load lock chamber in White et al. and Hayashi in order to generate a native oxide layer in wafer while loaded in the load lock chamber as taught by Shimada.

Response to Arguments

38. 112 rejections have been withdrawn.

39. Applicant's arguments based on accompanying amendments, filed 30 September 2003, with respect to the rejection(s) of claim(s) 1-6, 8-11 and 13-14 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection are made in view of White et al., Hayashi and Theriault et al. White et al. and Hayashi are recited to address Applicant's with respect to the number of substrates processed and the transferring arm having a temperature adjusting portion capable of cooling, respectively.

Application/Control Number: 09/986,894

Art Unit: 1763

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner can be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Gregory Mills can be reached on 703.308.1633. The fax phone number for the organization that this application or proceeding is assigned is 703.872.9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
17 November 2003

primary Ex
AV 176
P. Hall:

